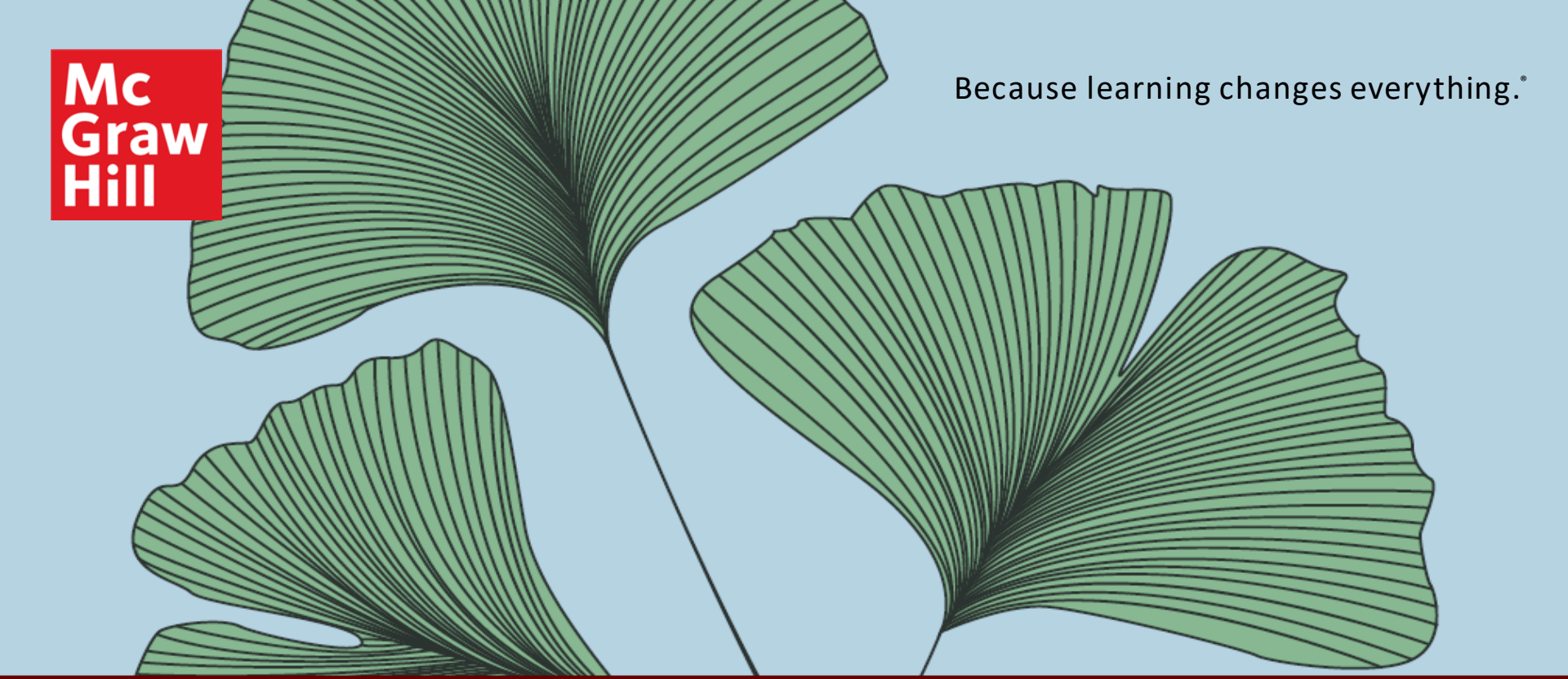

Chapter 7

Saving and Capital Formation

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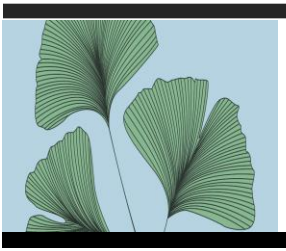

Learning Objectives

1. Explain the relationship between saving and wealth.
2. Discuss the reasons people save and how psychological factors influence saving.
3. Identify and apply the components of national saving.
4. Discuss the reasons firms choose to invest in capital.
5. Analyze financial markets using the tools of supply and demand.

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Savings and Wealth

Saving is current income minus spending on current needs.

- The **saving rate** is saving divided by income.

Wealth is the value of assets minus liabilities.

- **Assets** are anything of value that one owns.
- **Liabilities** are the debts one owes.

  The **balance sheet** is a list of an economic unit's assets and liabilities.
- **Net worth** is an economic unit's wealth determined by subtracting liabilities from assets.

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Consuelo's Balance Sheet

Assets		Liabilities	
Cash	$80	Student loan	$3,000
Checking account	1,200	Credit card balance	250
Shares of stock	1,000		
Car (market value)	3,500		
Furniture (market value)	500		
Total	**$6,280**		**$3,250**
		Net worth	**$3,030**

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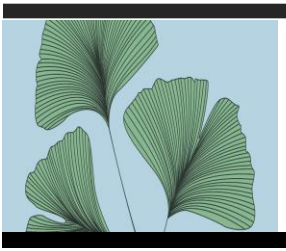

Flow Values and Stock Values

A **flow** value is defined per unit of time.

- Income.
- Spending.
- Saving.
- Wage.

A **stock** value is defined at a point in time.

- Wealth.
- Debt.

The *flow of savings* causes the *stock of wealth* to change.

- Every dollar a person saves adds to his wealth.

A high rate of saving today leads to an improved standard of living in the future.

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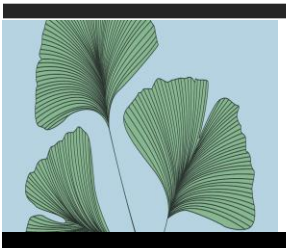

Capital Gains and Losses

Wealth changes when the value of your assets change.

- **Capital gains** increases the value of existing assets.
  - Higher value for stock.
- **Capital losses** decreases the value of existing assets.
  - Car accident damages bumper and front headlight.

Change in wealth = Saving + Capital gains – Capital losses

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American Household Wealth in the 1990s and 2000s

Stock ownership increased in the 1990s.

- Direct purchases.
- Mutual funds.
- Pension and retirement funds.

Stock prices rose rapidly.

- Capital gains on stocks increased household wealth.
  - May have decreased household savings.

Stock market declined, 2000 – 2002.

- Household savings remained low.
- Value of privately-owned homes increased rapidly.

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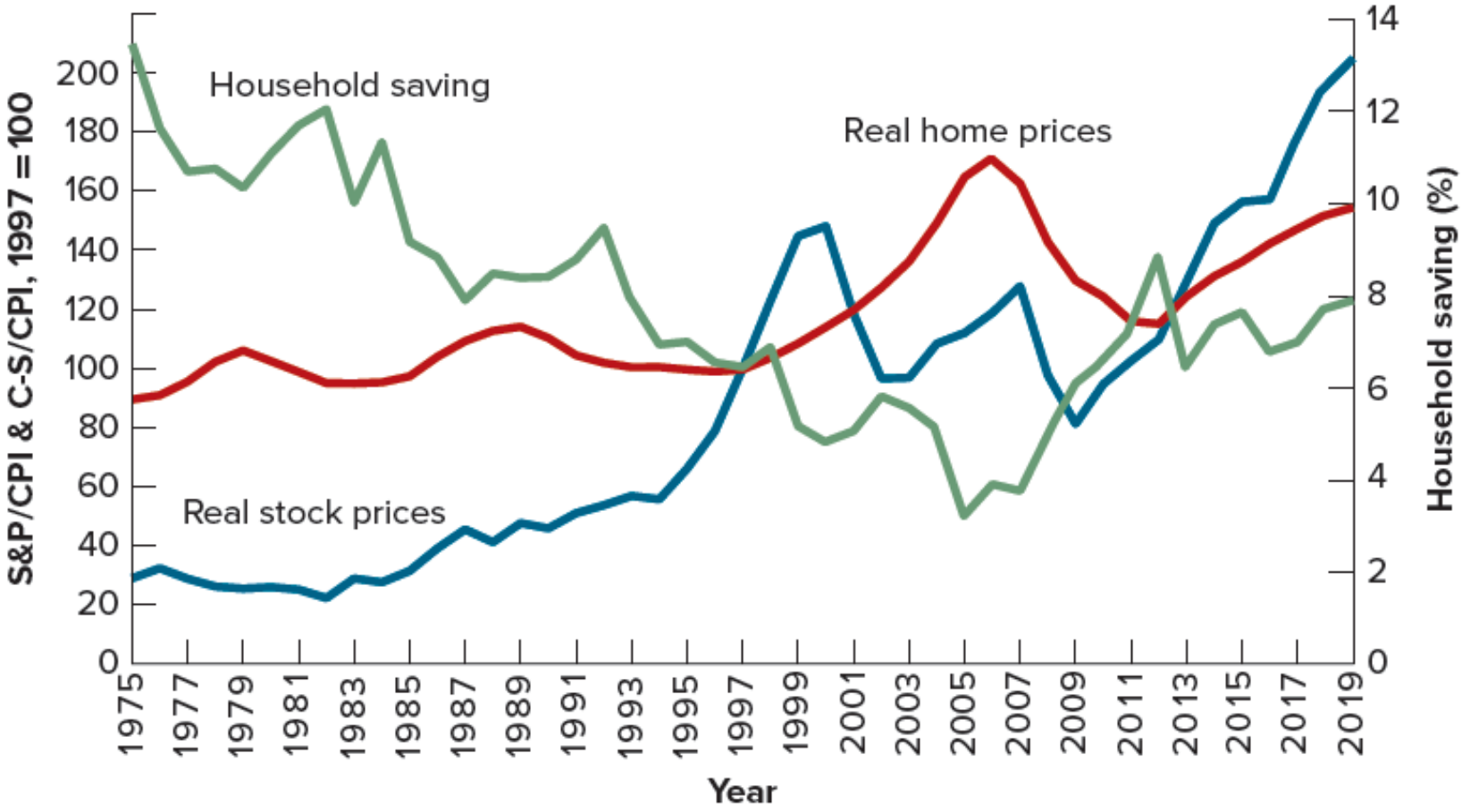
Savings and Capital Gains, 1975 – 2019



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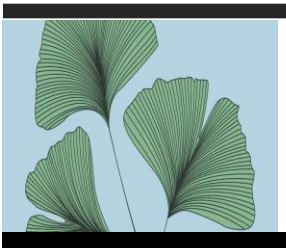

Why Do People Save?

1. **Life-cycle saving** is to meet long-term objectives
   - Retirement.
   - Purchase a home.
   - Children's college attendance.
2. **Precautionary saving** is for protection against setbacks
   - Loss of job.
   - Medical emergency.
3. **Bequest saving** is to leave an inheritance
   - Mainly higher income groups.

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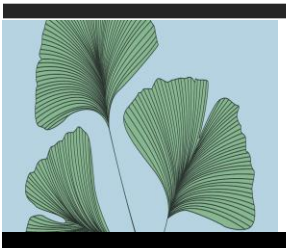

Household Saving in China

Chinese households save about 25% of disposable income, a very high rate.

- This is new: was only 10% until late 1980s.

Life-cycle and precautionary motives are important.

- Wealth has come recently to China.
- Young people richer than older people.
- Saving of young outweighs dissaving of old.
- Limited social safety net.

Little opportunity for individuals to borrow, savings are necessary for large purchases.

Savings is recent because before reforms, not as many opportunities for precautionary saving, and less need.

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Saving and the Real Interest Rate

Savings often take the form of financial assets that pay a return.

- Interest-bearing checking.
- Savings.
- Mutual funds.
- Bonds.
- CDs.
- Stocks.

The real interest rate (r) is the nominal interest rate (i) minus the rate of inflation (π).

- The increase in the real purchasing power of a financial asset.
- Real rate of return.

$$r = i - \pi$$

Nominal interest rate (market interest rate) is the annual percentage increase in the nominal, dollar, value of an asset.

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Thrifts and Spends 1

Two otherwise identical families have different savings rates.

- Higher savings reduces current consumption.
  - Thrifts consume $32,000 in 1995 and Spends consume $38,000.
  - Thrifts get more unearned income.

Thrift's income grows faster.

- From 2000 on, Thrifts consume more than Spends.

	Spends	Thrifts
Savings Rate	5%	20%
Start Date	1995	1995
End Date	2030	2030
Real Income	$40,000	$40,000
Real Interest	8%	8%

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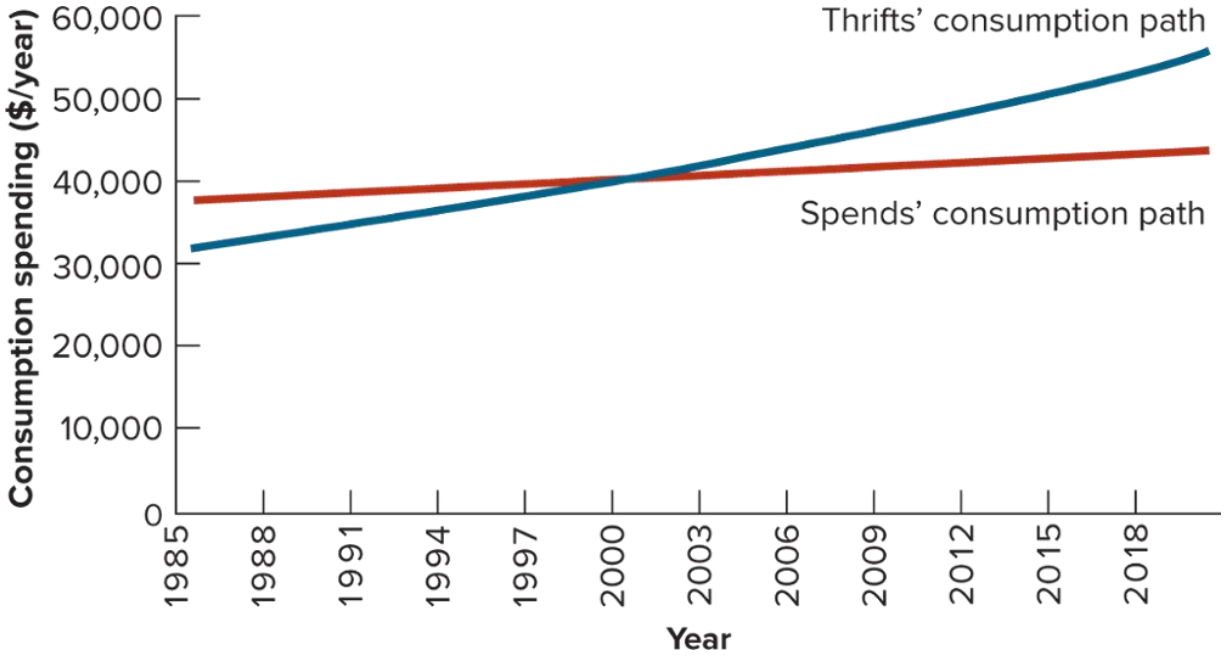
Thrifts and Spends 2

By 2030.

- Spend's consumption is $12,000 more than Thrift's.
- Retirement savings is $385,000.
  - Spend's accumulated savings is $77,000.



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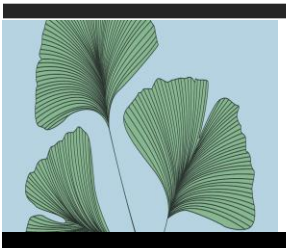

Savings in Perspective

8% is approximately the return to mutual funds since its inception in 1926.

20% savings is higher than typical household.

- Many have $5,000^{+} in credit card debt at high interest rates.

Bottom line: High savings rate pays off in the long run.

If people are target savers, a high interest rate lowers savings rate.

- To get $25,000 in five years,
  - Save $4,309 per year at 5% OR.
  - Save $3,723 per year at 10%.

Data show higher real rates increase savings modestly.

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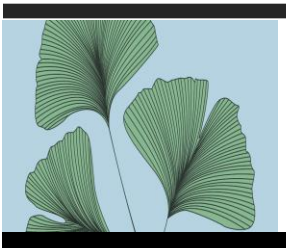

Saving, Self-Control, and Demonstration Effects [1]

Psychologists suggest individual **self-control** may be too weak to produce rational outcomes.

- Smoking, obesity, gambling, and spending.

Devices to support savings.

- Make savings automatic and withdrawals costly.
  - Penalties for early withdrawal of IRA funds.

Easy borrowing supports high levels of current spending.

- Credit cards.
- Home equity loans.

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Saving, Self-Control, and Demonstration Effects 2

Savings rate may be depressed by.

- Social Security, Medicare, and other government programs for the elderly.
- Mortgages with small or no down payment.
- Confidence in a prosperous future.
- Increasing value of stocks and growing home values.
- Readily available home equity loans.
- **Demonstration effects** and status goods.

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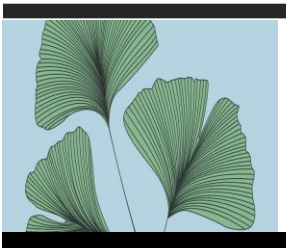

National Savings

Macroeconomics studies total savings in the economy.

- Household savings is one component.
- Business and government savings are other parts.

Start with the definition of production and income for the economy.

$$Y = C + I + G + NX$$

***Y* = aggregate income**

C = consumption expenditure	*G* = government purchases of goods and services
I = investment spending	*NX* = net exports

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Calculate National Savings

Assume *NX* = 0 for simplicity.

National savings (*S*) is current income less spending on current needs.

- Current income is GDP or *Y.*

Spending on current needs.

- Exclude all investment spending (*I*).
- Most consumption and government spending is for current needs.
  - For simplicity, we assume all of *C* and all of *G* are for current needs.

$$S = Y - C - G$$

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National Savings, 1960-2019

Since 1960, national savings rate has been 13 – 15% in recent years.

- Less volatile than household savings.

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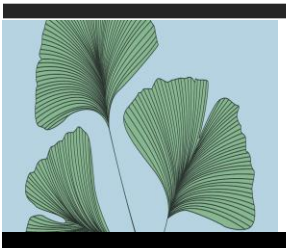

Private Saving 1

Private saving is household plus business saving.

Household's total income is *Y.*

Households pay taxes (*T*) from this income.

- Government transfer payments increase household income.
  - **Transfer payments** are made by the government to households without receiving any goods in return.
- Interest is paid to government bond holders.

***T* = Taxes – Transfers – Government interest payments**

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Private Saving 2

Private saving is after-tax income less consumption.

$$S_{PRIVATE} = Y - T - C$$

Private saving is done by households and businesses.

- Household saving or personal saving is done by families and individuals.
- Business savings makes up the majority of private saving in the U.S.
  - Business savings is:

    Revenues − Operating costs − Dividends to shareholders
  - Business savings can purchase new capital equipment.

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Public Saving and National Saving

Public saving is the amount of the public sector's income that is not spend on current needs.

- Public sector income is net taxes.
- Public sector spending on current needs is *G.*

$$\mathbf{S_{PUBLIC} = T - G}$$

National saving (S) is private savings plus public savings.

$$S_{PRIVATE} + S_{PUBLIC} = (Y - T - C) + (T - G)$$

$$\boldsymbol{S = Y - C - G}$$

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The Government Budget

Balanced budget occurs when government spending equals net tax receipts.

- **Government budget surplus** is the excess of government net tax collections over spending ($T - G$).
  - Budget surplus is public savings.
- **Government budget deficit** is the excess of government spending over net tax collections ($G - T$).
  - Budget deficit is public dissavings.

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Government Saving

Federal Government (billions of dollars)		2000
	Receipts	$2,068.4
	Expenditures	1,912.9
State and Local Governments		
	Receipts	1,304.1
	Expenditures	1,344.8

Federal Government (billions of dollars)		2018
	Receipts	$3,497.7
	Expenditures	4,507.4
State and Local Governments		
	Receipts	2,623.0
	Expenditures	2,862.1

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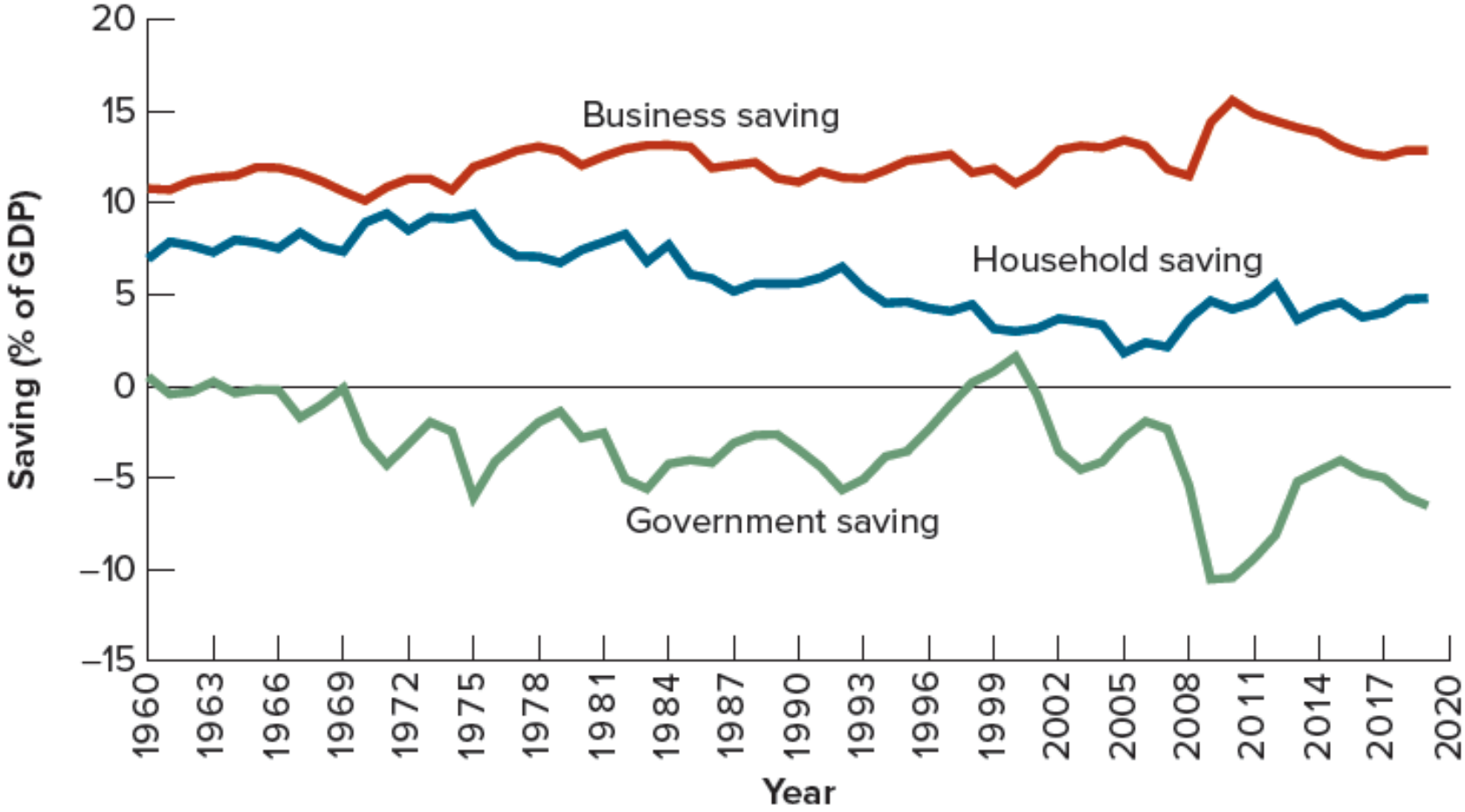
Three Components of National Saving, 1960-2019



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Low Household Savings

National savings determines a country's ability to invest in new capital goods.

- Household savings has been low.
- Business saving has been significant.
- In the 1990s, government saving increased.

From 1960 to 2002, national saving rate was fairly stable.

From 2002 to 2007, government dissaving contributed to a decline in the U.S. national saving rate.

Much larger government dissaving during 2007-2009 recession.

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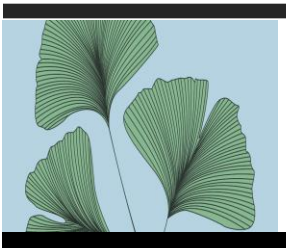

Investment and Capital Formation

Investment is the creation of new capital goods and housing.

Firms buy new capital to increase profits.

- *Cost-Benefit Principle.*
- Cost is the cost of using the machine or other capital.
- Benefit is the value of the marginal product of the capital.

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Lauren and the Lawn Mower 1

Lauren's lawn care business plan.

- Cost of lawn mower = $4,000.
  - Interest on loan = 6%.
  - Assume the mower can be resold for $4,000.
- Net revenue = $6,000 per summer.
  - Taxes = 20%.
  - Lauren could earn $4,400 per summer after tax working elsewhere.

Cost-Benefit Principle indicates whether Lauren should start the business.

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Lauren and the Lawn Mower 2

- Business plan analysis.

Net revenue	$6,000
Less taxes (20%)	$1,200
Less opportunity cost	$4,400
Equals VMP of lawnmower	$400
Less interest (6%)	$240
Equals net benefit	$160

- Lauren should start the business.

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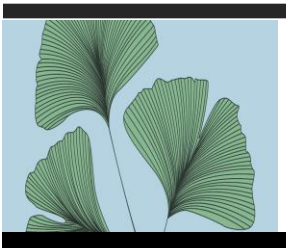

The Investment Decision

Two important costs.

- Price of the capital goods.
- Real interest rates.
  - Opportunity cost of the investment.

Value of the marginal product of the capital is its benefit.

- Net of operating and maintenance expenses and of taxes on revenues generated.
- Technical innovation increases benefits.
- Lower taxes increase benefits.
- Higher price of the output increases benefits.

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Saving, Investment, and Financial Markets 1

Supply of savings (*S*) is the amount of savings that would occur at each possible real interest rate (*r*).

- The quantity supplied increases as r increases.

Demand for investment (*I*) is the amount of savings borrowed at each possible real interest rate.

- The quantity demanded is inversely related to *r.*

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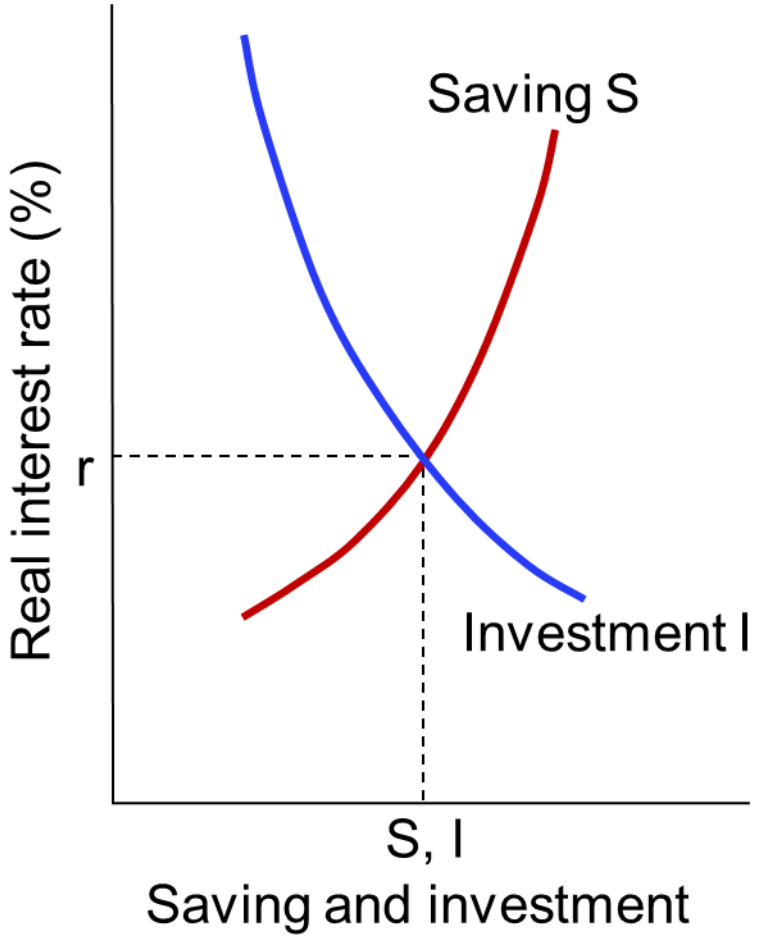
Financial Market

Equilibrium interest rate equates the amount of saving with the investment funds demanded.

- **If *r* is above equilibrium, there is a surplus of savings.**
- **If *r* is below equilibrium, there is a shortage of savings.**



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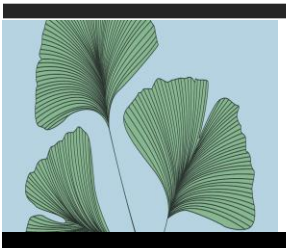

Financial Markets Are Markets

Financial markets adjust to surpluses and shortages as any other market does.

Changes in factors other than real interest rates will shift the savings or investment curves.

- New equilibrium.

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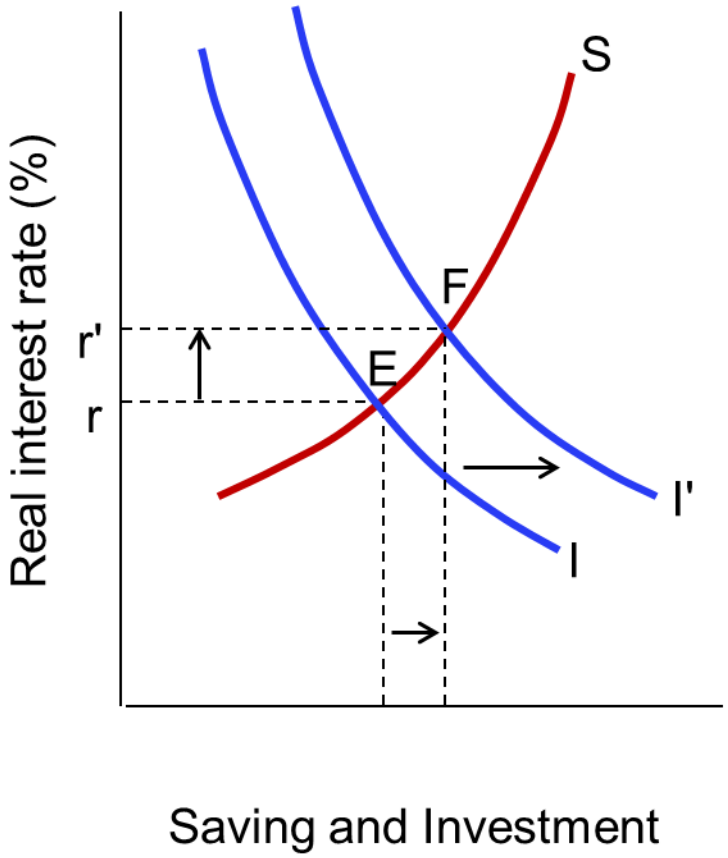
Technological Improvement



New technology raises marginal productivity of capital.

- Increases the demand for investment funds.
- Movement up the savings supply curve.
- Higher interest rate.
- Higher level of savings and investment.

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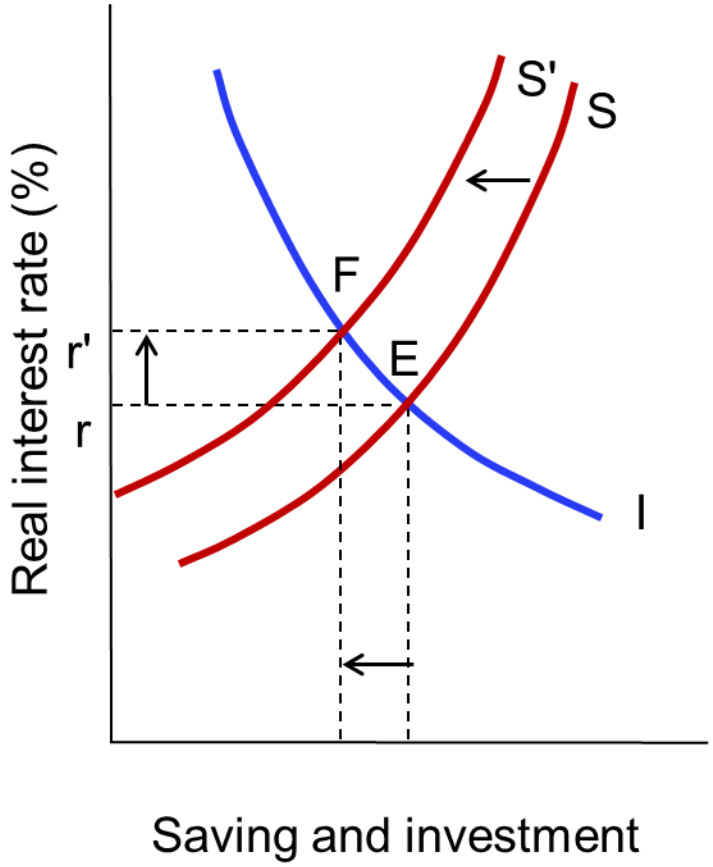
Government Budget Deficit Increases



Government budget deficit increases.

- Reduces national saving.
- Movement up the investment curve.
- Higher interest rate.
- Lower level of savings and investment.

Private investment is ***crowded out***.

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Increase National Saving

Policymakers know the benefits of increased national saving rates.

- Reducing government budget deficit would increase national saving.
  - Political problems.
- Increase incentives for households.
  - Federal consumption tax.
  - Reduce taxes on dividends and investment income.

Higher national saving rate leads to greater investment in new capital goods and a higher standard of living.

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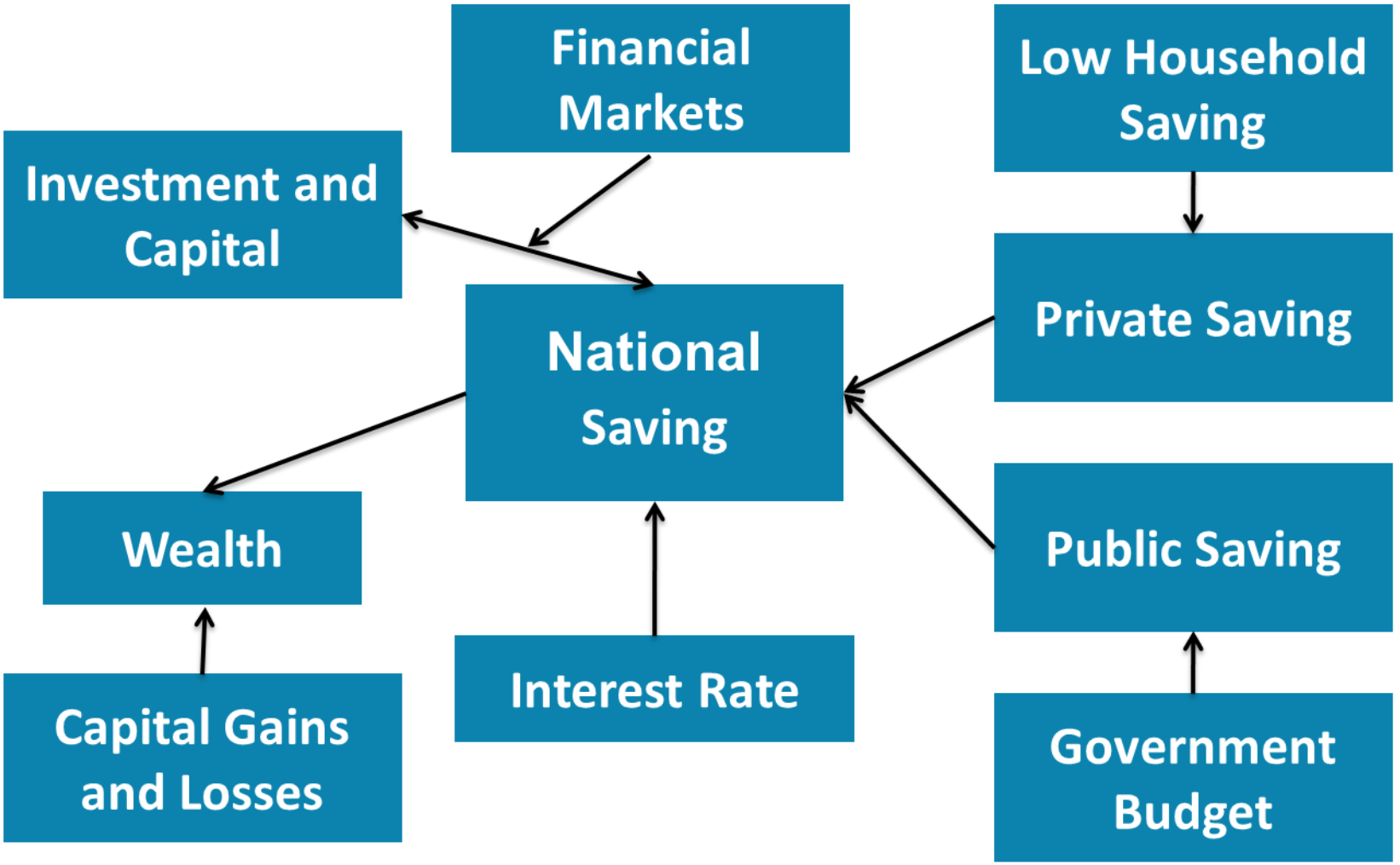

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